

EVPP 506 SCIENCE OF THE ENVIRONMENT I

GEORGE MASON UNIVERSITY

3 Credit Hours Fall 2023 CRN 83130

4:30-7:10 p.m. Mondays, INNOVATION HALL, Room 205, face-to-face class

“At the place George Mason University occupies, we acknowledge the land of the Rappahannock, Pamunkey, Upper Mattapoini, Chickahominy, Eastern Chickahominy, Nansemond, Monacan, Patawomeck, Nottaway and Piscataway tribes, whose presence—past, present, and future—we recognize and respect.”

Instructor: Dr. Esther Peters
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703-624-0143

Office Hours: Mondays, 3:15–4:15 p.m. in person or by appointment (send e-mail request) and you will receive a Zoom link to meet at the scheduled time with Dr. Peters.

Sign up for Mason Alert (e.g., weather closings, emergencies) at
<https://ready.gmu.edu/masonalert/>

See Emergency Preparedness Guides: <https://ready.gmu.edu/be-prepared/>

Description

Environmental science is explored in this 2-semester sequence providing the foundation in chemistry (I) and biology (II) required for graduate students with social sciences backgrounds seeking a degree and career in environmental science and policy. This course will examine the multitude of environmental problems (global warming, energy sources, air and water pollution) facing society with an emphasis on understanding the chemistry involved. The basic principles of chemistry will be reviewed and applied in a manner that will enable the student to develop a framework for evaluating current and future threats to the environment.

Course Objectives and Student Learning Outcomes

Students will participate in individual and team assignments to be able to:

- Understand the basic chemical nature of environmental problems.
- Relate molecules to structures and to functions that shape and control the biosphere.
- Think critically about the chemistry involved in environmental issues and their solutions.

- Achieve success in advanced environmental science courses.
- Feel more confident engaging scientists, academics, and policy makers in discussions on the chemical aspects of environmental problems.

Course Expectations

As with any graduate offering, ***this will not be an easy course***. The successful student **must read assignments, study supporting materials, and prepare assignments outside of class**. Self-directed study skills are important. Students need to organize material logically and communicate well orally and in writing. **The emphasis will be on understanding the basics.**

Please turn off cell phones or pagers before class begins. **Professional behavior and adherence to the GMU Honor Code are expected. Absenteeism should be limited to illness or emergencies.** Students should notify the instructor before class whenever possible if they must miss a class. Students will need to work with the instructor to determine whether class activities can be made up later, although this is likely to be difficult due to schedule conflicts. Students should contact classmates to obtain notes and assignments.

Communication

Students are required to use their GMU email accounts for all class-related communications. Students are encouraged to have a professional email signature. If you have questions about content for a missed class, please contact your classmates. If you are not getting messages, please send Dr. Peters an alternate email address. You can Send Email to the instructor or classmates in Blackboard. Dr. Peters will send updates on how to continue learning by email if the campus is closed.

Assignments and Due Dates

Assignments should be prepared neatly (either hand- or type-written or computer-generated). Be sure to proofread your work to double-check facts, grammar, spelling, and consistency, completeness, and correctness. Be sure you have followed all directions. This book may help:

Ross-Larson, B. 1996. *Edit Yourself: A Manual for Everyone Who Works With Words*. W.W. Norton & Co., New York, NY.

Missed Exams

A quiz will be given at the start of selected classes and mid-term and final exams will be given as indicated on the schedule. If a student is seriously ill or must miss the test for

another reason, notify your professor, share your doctor's note or other evidence for the missed class with Dr. Peters, and options for completing the test will be discussed.

Basic Course Technology Requirements

Activities and assignments in this course will regularly use the Blackboard learning system, available at <https://mymason.gmu.edu>. Students are required to have regular, reliable access to a computer with an updated operating system (recommended: Windows 10 or Mac OSX 10.13 or higher) and a stable broadband Internet connection (cable modem, DSL, satellite broadband, etc., with a consistent 1.5 Mbps [megabits per second] download speed or higher. You can check your speed settings using the speed test on this website.)

Course Textbook and Materials

This semester you will use a textbook with online resources to help you learn. In addition, materials will be posted on Blackboard during the course. The textbook we will use for the course is:

B.D. Fahlman et al. 2021. *Chemistry in Context: Applying Chemistry to Society, 10th edition*. McGraw-Hill Education.

We are using this eBook (abbreviated "CinC") with McGraw-Hill Connect to access their mobile app, question banks, and many other resources that should be helpful in learning chemistry concepts. This is a First Day[®] Inclusive Access program. You will have access to the materials on the first day of class. Please see the **Video: How to Access the Textbook and Connect** by clicking on the link in the black bar on the left side of Blackboard, which explains how to do this. Mason will bill the cost of the materials to you at the discounted price as a course charge. The bookstore will send you information on how this works (and see also the video here: <https://vimeo.com/755656116/ba772aa029>). All you will need to do is click on **Course Materials** in the left side black bar in Blackboard to access them.

You have the option to Opt-Out of this program in the LMS. However, please be advised it is NOT recommended that you Opt-Out, as these materials are required to complete the course. If you choose to opt out, you will be responsible for purchasing your course materials at the normal retail price. Please let Dr. Peters know if you have any questions about this.

You will also find additional help in whatever biology textbook you used for EVPP 507, if you have taken it, as well as:

Spark Charts "Chemistry" available in the bookstore or online
<http://www.sparknotes.com/chemistry/>

Khan Academy "Chemistry" <https://www.khanacademy.org/science/chemistry>

Valuable web resources include:

<http://www.sparknotes.com/chemistry/>

<https://www.khanacademy.org/science/chemistry>

<http://www.onelook.com> (to look up terms)

And the YouTube videos in the *Crash Course Chemistry* series for another perspective!

Course Requirements

Besides learning core concepts in chemistry by listening to lectures, reading the textbook, and answering quizzes, students will prepare short presentations and take a midterm and a final exam. More information will be provided by the instructor.

Grading Criteria

The total grade received for this course will be based on the following assignments and assessments:

<u>Percent Contribution to Total Grade</u>		
Participation (attendance, interaction)	5 %	40 pt
Homework (SmartBook, Questions)	5 %	40 pt
Five Quizzes (40 pt each, 1 dropped) and	20 %	160 pt
Five Short Presentations (32 pt each)	20 %	160 pt
Midterm Exam	25 %	200 pt
Final Exam	25 %	200 pt
	100%	800 pts

An A+ will only be given to reward a truly outstanding effort and performance. Participation requires attendance in class and checking Blackboard for updates and notices at least once per week. The final grade will be based on this scale:

A+ = 100(+)-98, A = 97-90, A- = 89-88, B+ = 87-86, B = 85-80, B- = 79-78, C+ = 77-76, C = 75-70, F ≤ 69

Academic Integrity and our Honor Code

Academic Integrity <https://oai.gmu.edu>

Honor Code <https://oai.gmu.edu/full-honor-code-document/>

The principle of academic integrity is taken very seriously, and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper,

accepted form. Students in this course should be aware of the following policies for completing work and taking examinations:

Sharing of materials may be limited by what those materials contain and where they are shared. Sharing instructor-created materials, particularly materials relevant to assignments or exams, to public online “study” sites is considered a violation of Mason’s Honor Code. Some kinds of participation in online study sites violate the Mason Honor code: these include accessing exam or quiz questions for this class; accessing exam, quiz, or assignment answers for this class; uploading of any of the instructor’s materials or exams; and uploading any of your own answers or finished work. Always consult your professor before using these sites. You are able to use the McGraw-Hill materials for studying and, as indicated, for completing assignments and quizzes or exams.

Another aspect of academic integrity is the free play of ideas. Asking questions, discussing concerns, and debating issues are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification. Students are expected to complete the work on their own or as a team, depending on the assignment. All exams will be completed by individuals.

It is important to note that materials produced for this course require creativity in organization and presentation, and the information presented in the paper or other product must be properly acknowledged as to its source. While you may use artificial intelligence (AI) software (e.g., ChatGPT) to help you (generate ideas, brainstorm), please add a note to your assignment that describes where in your process you used AI and which platform(s) you used. Material generated by these programs may be inaccurate or incomplete. Statements of a general nature or that synthesize information from several sources need not be attributed to a specific source; however, material generated by an AI program should be cited like any other reference material (be sure to check if the AI citations are accurate or fake). Statements of specific details or direct quotations (“between quotation marks”) from books, journals, newspaper or other media articles, Internet web pages, or other authorities must be identified with the name of the author and year in the text and the full citation provided in a literature cited section at the end of the paper using the format required by the instructor. To cite, for example, use of ChatGPT-3, use this format: “ChatGPT-3. (YYYY, Month DD of query). "Text of your query." Generated using OpenAI. <https://chat.openai.com/>." You are responsible for the content of your products.

Diversity Policy

We seek to create a learning environment that fosters respect for people across identities. We welcome and value individuals and their differences, including gender expression and identity, race, economic status, sex, sexuality, ethnicity, national origin, first language, religion, age and ability. We encourage all members of the learning environment to engage with the material personally, but to also be open to exploring and learning from experiences different than their own. The Anti-Racism and Inclusive

Excellence Taskforce (ARIE) is continuing to consult with faculty, students, and campus offices to develop resources to support faculty in anti-racist teaching approaches. At Mason we remain committed to providing a safe learning, living, and working environment that embraces our diversity and is free from discrimination.

Sexual Harassment, Sexual Misconduct, and Interpersonal Violence

George Mason University is committed to providing a learning, living, and working environment that is free from discrimination and a campus that is free of sexual misconduct and other acts of interpersonal violence in order to promote community well-being and student success. We encourage students who believe that they have been sexually harassed, assaulted or subjected to sexual misconduct to seek assistance and support. University Policy 1202: Sexual Harassment and Misconduct speaks to the specifics of Mason's process, the resources, and the options available to students. As a faculty member and designated "Responsible Employee," I am required to report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's Title IX Coordinator per university policy 1412. If you wish to speak with someone confidentially, please contact the Student Support and Advocacy Center (703-380-1434) or Counseling and Psychological Services (703-993-2380). You may also seek assistance from Mason's Title IX Coordinator (703-993-8730; titleix@gmu.edu).

Other Useful Campus Resources

Many are now available to students, including the University Writing Center, Learning Center, Libraries, Counseling and Psychological Services. Please go to:

<https://stearnscenter.gmu.edu/knowledge-center/knowing-mason-students/student-support-resources-on-campus/>

and click on the one you need for the most up-to-date information!

NAME AND PRONOUN USE: If you wish, please share your name and pronouns with me and how best to address you in class and via email. You may also choose to update your chosen name and pronouns here: <https://registrar.gmu.edu/updating-chosen-name-pronouns/>. I use "she/her/hers" for myself and you may address me as "Dr. Peters" or as "Esther" (since you are graduate students) in email and verbally.

RELIGIOUS HOLIDAYS: the calendar of religious holidays and observations is posted here (<https://ulife.gmu.edu/religious-holiday-calendar/>). Please let Dr. Peters know in advance if any religious observances affect your participation in class activities and assignments.

WRITING CENTER: <https://writingcenter.gmu.edu>

UNIVERSITY LIBRARIES: "Ask a Librarian" <https://library.gmu.edu/tutorials/librarians-help>

COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS): <https://caps.gmu.edu>

NEW! TIMELYCARE: Mason students now have FREE access to TimelyCare – a virtual mental health and well-being platform crafted specifically for college students! With TimelyCare, Mason students will have access to a multitude of virtual mental health and well-being resources that are free and available 24/7. Find out more about the resources available online at [Timelycare.com/gmu](https://timelycare.com/gmu) or download the app.

LEARNING SERVICES: 703-993-2999; <https://learningservices.gmu.edu/>; offers many good study skills workshops!

The University Catalog, <http://catalog.gmu.edu>, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at <http://universitypolicy.gmu.edu/>. All members of the university community are responsible for knowing and following established policies.

Student communication of e-mail information (Opt-in Form):
<https://provapps.gmu.edu/OptInApp/Default.aspx>

NAMES AND PHONE NUMBERS OF CLASSMATES:

Notes:

Tentative Schedule: The following weeks will include lectures on significant environmental topics and the chemistry needed to understand the topic at a professional level. Students are then expected to read assigned chapters from the textbook, and use Connect learning tools and other resources to learn the material. Assignment information will be posted on Blackboard or in the PowerPoints. Students will also prepare five short PowerPoint presentations (no longer than 10 minutes).

****TENTATIVE SCHEDULE FOR FALL 2023****

EVPP 506 SCIENCE OF THE ENVIRONMENT I

Lecture and Reading Assignments

Week	Lecture	Reading or Other Assignments Due the Following Week
1 August 21	<p>Introductions, syllabus, overview of environmental science, measurements, units, uncertainties, scientific method, matter, elements, chemistry, and mercury contamination</p> <p>Overview of Chemistry</p>	<p>CinC: Chapter 1 Portable Electronics...</p> <p>BB: Review Introduction to Connect, read Chapter 1, do Chapter 1 Smartbook Homework, do Chapter 1 Homework</p> <p>Select topics for next weeks' presentations and submit</p> <p>History of the world in 2 hours http://www.youtube.com/watch?v=qdLFCz1Y508</p> <p>Also browse http://www.scaleofuniverse.com/</p>
2 August 28 <i>Last Day to Add</i>	<p>Earth's Atmosphere, Air Pollution</p> <p>Review topics for next weeks' presentations</p>	<p>CinC: Chapter 2 The Air We Breathe</p> <p>BB: read Chapter 2, do Chapter 2 Smartbook Homework, do Chapter 2 Homework</p> <p>BB: take Chapter 2 Quiz</p> <p><i>Prepare assigned short presentations</i></p>
3 September 4	LABOR DAY	GMU CLOSED NO CLASS TODAY

Week	Lecture	Reading or Other Assignments Due the Following Week
4 September 11	Solar Radiation Short presentations	CinC: Chapter 3 Radiation from the Sun BB: read Chapter 3, do Chapter 3 Smartbook Homework BB: take Chapter 3 Quiz <i>Prepare assigned short presentations</i>
5 September 18	Climate and Change Short presentations	CinC: Chapter 4 Climate Change BB: read Chapter 4, do Chapter 4 Smartbook Homework, do Chapter 4 Homework <i>Prepare assigned short presentations</i>
6 September 25	Water Resources Short presentations	CinC: Chapter 5 Water Everywhere... BB: read Chapter 5, do Chapter 5 Smartbook Homework, do Chapter 5 Homework BB: take Chapter 5 Quiz <i>Prepare assigned short presentations</i>
7 October 2	Toxicology Review of first half of the semester	Study for Midterm Exam
8 October 10	CLASS MEETS ON TUESDAY DUE TO FALL BREAK HOLIDAY ON MONDAY	Midterm Exam (Submit on or before October 15)
9	Energy Sources	CinC: Chapter 6 Energy from

Week	Lecture	Reading or Other Assignments Due the Following Week
October 16		Combustion; Chapter 7 Energy from Alternative Sources; Chapter 8 Energy Storage BB: read Chapters 6, 7, 8; do Chapters 6, 7, 8 Smartbook Homework, do Chapters 6, 7, 8 Homework <i>Prepare assigned short presentations</i>
10 October 23	Return Midterm Exam Short presentations	CinC: Chapter 9 The World of Polymers and Plastics BB: read Chapter 9, do Chapter 9 Smartbook Homework, do Chapter 9 Homework BB: take Chapter 9 Quiz <i>Prepare assigned short presentations</i>
11 October 30	Short presentations	CinC: Chapter 10 Brewing and Chewing; Chapter 11 Nutrition BB: read Chapters 9 and 10, do Chapters 9 and 10 Smartbook Homework, do Chapters 9 and 10 Homework <i>Prepare assigned short presentations</i>
12 November 6	Short presentations	CinC: Chapter 12 Health & Medicine BB: read Chapter 12, do Chapter 12 Smartbook Homework, do Chapter 12 Homework

Week	Lecture	Reading or Other Assignments Due the Following Week
		<i>Prepare assigned short presentations</i>
13 November 13	Short presentations	CinC: Chapter 13 Genes and Life BB: read Chapter 13, do Chapter 13 Smartbook Homework, do Chapter 13 Homework BB: take Chapter 13 Quiz <i>Prepare assigned short presentations</i>
14 November 20	Short presentations	Study for Final Exam
15 November 27	Final Exam Provided	Work on Final Exam
16 December 11	Submit Final Exam by 7:10 p.m.	

Notes: